Instructions for Use
EOS CobaltChrome RPD

CE 0537

e-Manufacturing Solutions

Technical data

EN 1641 / ISO 22674 Rx Only

Intended Use / Indications: EOS CobaltChrome RPD (REF: 9011-0035) is cobalt based dental alloy intended for production of removable partial dentures in EOSINT M 270 Standard or EOSINT M 270 Dental installation mode. Composition and properties correspond to "type 5" CoCr dental material according to ISO 22674.
Contraindications: EOS CobaltChrome RPD is contraindicated for patients and users with a history of sensitivity to one or more of the elements contained in the alloy. In case of occlusal or approximal contact of different alloys electrochemically based reactions may very rarely occur.
Storaging: Store metal powder in closed containers in a dry place. Keep away from food and beverages.

Warnings: Metal powder or dust may cause sensitization by inhalation and skin contact. When grinding, shot peening, grit blasting the dental removable partial dentures or handling the metal powder, use adequate ventilation, protective eyewear, protective gloves, protective clothing and respirator mask with type P3 fine dust particle filter (e.g. type FFP3-EN149:2001). Wash hands after handling the powder or partial dentures.

Material properties after stress relieving (30 minutes at 1000 °C) and solution annealing (20 minutes at 1150 °C) procedures according to ISO 22674

Material composition

Co:	63.8 wt-%
Cr:	24.7 wt-%
Mo:	5.1 wt-%
W:	5.4 wt-%
Si:	1.0 wt-%
Fe:	max. 0.50 wt-%
Mn:	max. 0.10 wt-%

Free of Ni, Be and Cd according to ISO 22674

Relative density	approx. 100 %
Density	8.60 g/cm³
Proof strength	550 MPa
Percent elongation	7 %
Young's Modulus	200 GPa
Ultimate Tensile Strength:	1100 MPa
Vickers hardness HV10	370 HV
Melting interval	1410 - 1450 °C

Processing

Dental laboratory step 1: To be performed by dental technician.

Part design: Design the upper removable partial denture with a minimum thickness of 0.7 mm. For minor connectors use a diameter of 1.2 x 1.8 mm. For the sublingual bars of a lower partial denture, a diameter of 4 x 2 mm is recommended. Take care of adequate material thickness on clasps.
File preparation: Perform the file preparation of removable partial dentures using M270 module of 3Shape's CAMbridge 2013 or newer software. Follow the instructions of EOS Partials File Preparation Guideline.

Removable partial denture manufacturing step: To be performed by trained personnel.

Part building: To be performed by trained EOSINT M 270 Dental operator. Process parts following the Operation Manual of the EOSINT M 270 Dental installation mode using the CC40_RPD_040_default.job (dated 20150224). Use undamaged ceramic recoater blade (EOS product number: 2200-3013) in M 270. Rotate ceramic recoater blade so that chamfered edge is pointing left. Use 1.5 V setting in recirculating filter unit (RFS). Clean up all the surfaces of building platform before placing it inside EOSINT M 270 Dental system. Use only powder containers that have fully readable labels, no smearing of text sections. Sieve the EOS CobaltChrome RPD powder before each job using -63 µm ultrasonic sieve of IPCM-M or -63 µm powder sieve (EOS product number: 1212-0313). Clean up the protection window of f-Theta lens before each job. Replace filters of recirculating filter system of EOSINT M 270 Dental system when they get filled up. If the job to be built up gets interrupted (e.g. power cut or running out of powder during the job), reject the job and redo it. If the partial denture has broken off the support during the job, redo the partial denture using stronger supporting style. Do not use powder contaminated by different type powders. If M 270 reports the same error message constantly and cause of error cannot be cleared following operation manual, contact EOS Service hotline. EOS recommends to follow maintenance procedure of EOSINT M 270 Dental.

Stress relieving: The stress relieving is done using heat-treatment furnace (e.g. Nabertherm N41/H).
The stress relieving process is following:

1. Heat up furnace to 1000 °C.
2. Wear heat protection gloves and heat protection clothing when loading and unloading the hot furnace.
3. When furnace has reached 1000 °C, place platform inside the hot furnace. Temperature drops down.
4. When furnace reaches again 1000 °C (this takes 10-20 min), start timing of holding period.
5. Keep platform inside the furnace for 30 minutes after reaching 1000 °C.
6. After 30 minute holding period, take platform out and let cool down freely in ambient air.

Removal of partial dentures from platform: After stress relieving and cooling down of the platform, remove the parts from building platform using band saw, rotary cutter or pliers. Remove the remains of the supports using pliers. Do not remove reinforcement bars before solution annealing done.

Solution annealing: The solution annealing is done in solution annealing furnace (e.g. Zubler V300) always under vacuum atmosphere.
The solution annealing sequence is following:

1. Place partial dentures on a tray in standing position. Do not pile partial dentures over each other.
2. Wear heat protection gloves or long metallic laboratory pliers when loading and unloading the hot furnace.
3. Run pre-heat program.
4. After pre-heating let furnace cool down to 660 °C before placing partial dentures on the furnace lift.
5. Run following program:
   - Start temp 660 °C
   - Heat-up rate 200 °C/min
   - Hold at 1150 °C for 20 min
   - Vacuum ON
6. Remove the tray with the partial dentures from the furnace lift immediately after the furnace opens. Let the partial dentures cool down freely.

Dental laboratory step 2: To be performed by dental technician.

Finishing work: Polish all metallic surfaces by rubber polishing and using polishing paste intended for cobalt-chromium dental alloys to reach the high end gloss. Steam clean the finished removable partial denture thoroughly.
Application of acrylics: Use dental acrylics, e.g. Heraeus Pala Express, intended for removable partial dentures. Always follow the Instructions for Use of the acrylics material manufacturer.
Soldering: Use only the soldering materials and processes suitable for EOS CobaltChrome RPD. Always follow the Instructions for Use of the soldering material manufacturer. To do soldering with the flame BEGO Wirobond solder and Fluxsol flux are most recommended.
Laser welding: Use only the welding materials and processes suitable for EOS CobaltChrome RPD. Always follow the instructions of the soldering material manufacturer. To do laser welding filler material BEGO Wiroweld wire 0.35 mm diameter or 0.50 mm diameter are recommended.